**Small Business Innovation Research/Small Business Tech Transfer**

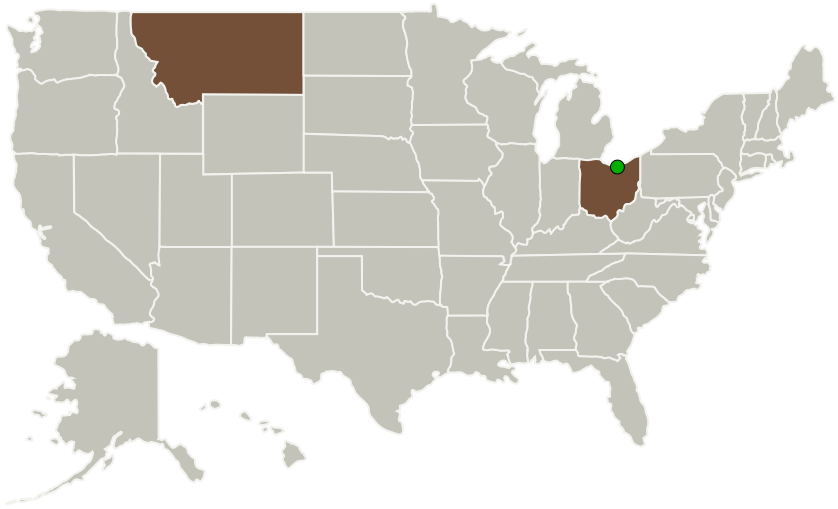
# Polarization Entangled Photon Pair Source for Space-Based Quantum Communication, Phase I

Completed Technology Project (2017 - 2017)

## Project Introduction

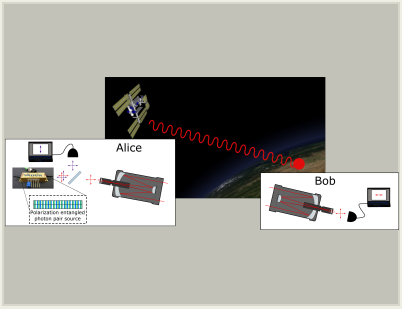
The overall goal of this NASA effort is to develop and deliver efficient, single-pass quantum optical waveguide sources generating high purity hyper-entangled photon pairs for use in high-rate long-distance links. The new devices will produce hyper-entangled photon pairs with high efficiency, pure spectral properties, and low attenuation, providing the key technology required for deployment of ground-to-space links and future construction of a global quantum network. The waveguide-based technology is compact, robust, and power efficient for deployment on space-based platforms such as the International Space Station.

## Primary U.S. Work Locations and Key Partners



| Organizations Performing Work | Role | Type | Location |
|---|---|---|---|
| ADVR, Inc. | Lead Organization | Industry | Bozeman, Montana |
| Glenn Research Center(GRC) | Supporting Organization | NASA Center | Cleveland, Ohio |

| Primary U.S. Work Locations | |
|---|---|
| Montana | Ohio |




Polarization entangled photon pair source for space-based quantum communication, Phase I Briefing Chart Image

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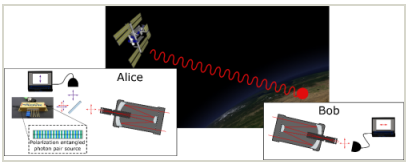
## Images




**Briefing Chart Image**
Polarization entangled photon pair source for space-based quantum communication, Phase I Briefing Chart Image *(https://techport.nasa.gov/image/130845)*

## Organizational Responsibility

**Responsible Mission Directorate:**

Space Technology Mission Directorate (STMD)

**Lead Organization:**

ADVR, Inc.

**Responsible Program:**

Small Business Innovation Research/Small Business Tech Transfer

## Project Management

**Program Director:**

Jason L Kessler

**Program Manager:**

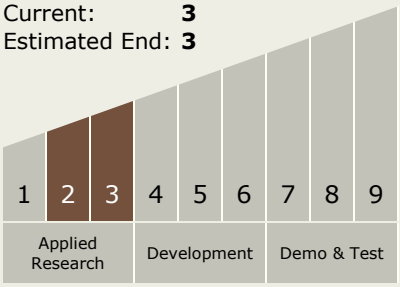
Carlos Torrez

**Principal Investigator:**

Anthony Roberts

## Technology Maturity (TRL)

Start: **2**
Current: **3**
Estimated End: **3**



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## Technology Areas

**Primary:**

- TX05 Communications, Navigation, and Orbital Debris Tracking and Characterization Systems
  - TX05.4 Network Provided Position, Navigation, and Timing
    - TX05.4.2 Revolutionary Position, Navigation, and Timing Technologies